

REMARKS

Claims 1-24 are pending. Claims 3-8 and 18-19 stand allowed. Claims 1-2, 9-17 and 20-23 stand rejected. By this Amendment, claim 24 is added to have a scope limited with respect to claim 1 to a structure where the reference signal is coupled to only one of the first and second frequency converters.

I. The Office Action Fails To Establish An Anticipation Case Against Claim 16

The Office Action rejects claim 16 under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 4,245,220 to Johnson. This rejection is respectfully traversed.

Anticipation under 35 U.S.C. §102(b) is a strict standard. "A claim is anticipated only if each and every element as set forth in the claims is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). "The identical invention must be shown in as complete detail as is contained in the ... claim." *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

Johnson does not disclose all of the limitations specified in claim 16 of the present application. This should not be surprising since Johnson addresses problems with active sonar systems in contrast to the present application that addresses problems with passive radio systems. For example, Johnson does not disclose a method that includes capturing a frequency difference present at two antennas as specified in claim 16 and therefore contained in all claims dependent thereon. Instead, Johnson discloses only capturing a frequency difference that is present at the outputs of transducers 1 and 2, not antennas as specified in claim 16. Johnson cannot anticipate claim 16 at least because "[t]he identical invention must be shown in as complete detail as is contained in the ... claim." *Richardson v. Suzuki Motor Co.*, *id.*

Accordingly, withdrawal of the rejection of claim 16 under 35 U.S.C. §102(b) as being anticipated by Johnson is earnestly solicited at least because the Office Action has failed to

provide evidence of an invention identical to the invention specified in claim 16. In particular, Johnson does not disclose capturing a frequency difference that is present at two antennas.

II. The Office Action Fails To Establish *Prima Facie* Obviousness Against Claims 1-2, 9, 14-15 and 21

The Office Action rejects claims 1-2, 9, 14-15 and 21 under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 4,245,220 to Johnson in view of U.S. Patent No. 5,107,522 to Kitayama, et al. (hereinafter Kitayama). This rejection is respectfully traversed.

A. Johnson Is Non-Analogous Art

Under the instructions of M.P.E.P. §2141.01(a), Johnson is non-analogous art. "In order to rely on a reference as a basis for rejection of an applicant's invention, the reference must either be in the field of the applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the inventor was concerned." *In re Oetiker*, 977 F.2d 1443, 1446, 24 USPQ2d 1443, 1445 (Fed. Cir. 1992).

Johnson is in a different field of endeavor than the invention of the present application. The field of endeavor of Johnson is that of a sonar system whereas the field of endeavor of the present invention is that of a radio system. Furthermore, the field of endeavor of Johnson is that of an active sonar system that include a sonar transmitter providing a specific predetermined sonar waveform whereas the field of endeavor of the present invention is that of a passive radio receiver that must receive any signal that is transmitted by a non-cooperating radio emitter. The particular problem with which the present invention deals is a measurement of range whereas Johnson deals with measuring only bearing angle.

In an exemplary case, the Federal Circuit held that a reference does not become analogous art to the patent claims, merely because the reference, like the claimed invention, dealt with single inline memory modules (SIMMs). See *Wang Laboratories, Inc. v. Toshiba Corp.*, 993 F.2d 858, 26 USPQ2d 1767 (Fed. Cir. 1993). The patent claims in that application dealt with SIMMs for installation on a printed circuit motherboard for use in a personal computer. In

Wang, the reference dealt with SIMMS used in industrial controllers. The reference was found to be in a different field of endeavor because it involved memory circuits in which modules of varying sizes may be added or replaced, whereas the claimed invention involved compact modular memories. The *Wang* Court held that the finding that the reference was non-analogous art was supported by substantial evidence because the SIMM of the claims at issue was intended for personal computers and used dynamic random-access-memories, whereas the reference SIMM was developed for use in large industrial machine controllers and only taught the use of static random-access-memories or read-only-memories.

Johnson is not in the same field of endeavor as the present invention. Johnson deals with an active sonar system designed to determine bearing angle to a sound reflective target. In Johnson, sonar signals are bounced off the reflective target. The active sonar system of Johnson includes a sonar transmitter to transmit a particular predetermined sound waveform, and Johnson actually requires the particular waveform specified in Johnson's patent for his device to work at all. The field of endeavor of the presently claimed invention deals with determining the range to a non-cooperating radio emitter using a passive radio receiver. The passive radio receiver of the present invention listens to a radio emitter and must cope with any waveform that the non-cooperating emitter chooses to transmit.

"A reference is reasonably pertinent if, even though it may be in a different field from that of the inventor's endeavor, it is one which, because of the matter with which it deals, logically would have commended itself to an inventor's attention in considering his problem." See *In re Clay*, 966 F.2d 656, 659, 23 USPQ2d 1058, 1060-61 (Fed. Cir. 1992). In the present case, Johnson is not pertinent to the particular problem with which the present invention deals at least because Johnson would not have commended itself to the inventor's attention for at least the following reasons.

1. Johnson deals with an active sonar system (column 1, lines 9-12), and the presently claimed invention deals with a passive radio receiver.
2. The active sonar system with which Johnson deals includes an echo signal receiver and a signal transmitter arrangement for transmitting pulses the frequency of which increase progressively during each pulse period from a frequency f to a frequency $f+\Delta f$ (emphasis added) (column 1, lines 14-17, 65-68). In contrast, the presently claimed invention deals with a passive radio

receiver for listening to a radio emitter (unconstrained by any particular form of transmitter modulation).

3. The particular problem with which Johnson is involved is the determination of a bearing angle using the active sonar. The active sonar system with which Johnson deals includes "a filter bank fed from the first mixer, the filters of the filter bank each having a different bandpass or slot whereby all slots in aggregation cover a predetermined frequency band so that the bearing of a target from which an echo signal is received is indicated in accordance with the slot or slots in which the echo signal is received" (column 1, lines 27-33, column 2, lines 25-34, and claim 1, i.e., column 4, lines 61-68). In contrast, the presently claimed invention deals with determining a range to an emitter, not a bearing angle, and no echo signal is received.

Accordingly, withdrawal of the rejection of claims 1-2, 9, 14-15 and 21 under 35 U.S.C. §103(a) as being unpatentable Johnson in view of Kitayama is earnestly solicited at least because the Office Action has failed to establish a *prima facie* case of obviousness since Johnson is non-analogous art.

B. Kitayama Is Non-Analogous Art

Even if, *arguendo*, Johnson were to be regarded as analogous art to the presently claimed invention, under the instructions of M.P.E.P. §2141.01(a), Kitayama is non-analogous art. The standards of what is analogous and non-analogous art are discussed above.

The field of endeavor of Kitayama deals with an automatic frequency control circuit (an AFC circuit) of a frequency converter for processing a digital modulation signal. More specifically, Kitayama deals with an AFC circuit in which the frequency of a frequency-converted digital modulation signal (to be supplied as an input to a demodulation circuit) is stabilized (see column 1, lines 8-21).

In contrast, the field of endeavor of the present invention deals with determining the range to a non-cooperating radio emitter using a passive radio receiver. Kitayama is not in the same field of endeavor as the presently claimed invention.

The particular problem with which Kitayama was involved is to overcome the problem of phase and amplitude variations in band pass filter 201 that are occasioned by temperature changes. Since the digital modulation signal passes through filter 201, the digital modulation

signal is influenced by the phase and amplitude variations of filter 201 and the frequency of the frequency-divided digital modulation signal becomes higher or lower than the frequency that should be provided to the phase comparator 303 under error free conditions. In effect, the temperature induce phase and amplitude variations of filter 201 are falsely propagated into error signals 304, 305 (see column 1, line 62 through column 2, line 7; FIG. 1).

In contrast, the presently claimed invention deals with a passive radio receiver for listening to a radio emitter (unconstrained by any particular form of transmitter modulation) and determining a range to an emitter. The problem addressed by Kitayama is not pertinent to the particular problem solved by the presently claimed invention.

Accordingly, withdrawal of the rejection of claims 1-2, 9, 14-15 and 21 under 35 U.S.C. §103(a) as being unpatentable Johnson in view of Kitayama is earnestly solicited at least because the Office Action has failed to establish a *prima facie* case of obviousness since Kitayama is non-analogous art.

C. Johnson In View Of Kitayama Lacks Motivation For The Proposed Modification

Even if, *arguendo*, Johnson were to be regarded as analogous art to the presently claimed invention and even if, *arguendo*, Kitayama were to be regarded as analogous art to the presently claimed invention, the Office Action still fails to establish a *prima facie* case of obviousness. Neither Johnson nor Kitayama provide substantial evidence of a motivation to combine the processor of Kitayama with the sonar receiving arrangement of Johnson in such a way that an RF bridge of Johnson receives a reference signal from the processor of Kitayama as specified in claims 1-2, 9, 14-15 and 21.

1. The Interpretation Of Claims And The Proposed Modification Of Johnson According To The Office Action

The Office Action construes the RF bridge as including the first, second and third frequency converters depicted in FIG. 2 of Johnson as 4, 10 and 3, respectively, (OA page 3, lines 3-8). The Office Action asserts that Johnson teaches a processor coupled to the filter bank but then admits that "Johnson fails to teach the processor and an rf bridge coupled to the

processor to receive a [sic.] reference signal from the processor,” (OA page 3, lines 8-10). The Johnson processor coupled to the filter bank and Kitayama’s microprocessor 307 are two distinct processors.

The Office Action asserts that “Kitayama teaches the simple, low cost oscillator frequency control via microprocessor ... for controlling of Johnson’s oscillator frequency fb,” (page 3, lines 14-15). This assertion is respectfully traversed.

Kitayama never mentions the Johnson patent at all. However, we assume that this Office Action assertion is a proposal to modify the sonar receiving arrangement of Johnson’s FIG. 2 to add a circuit derived from Kitayama to provide Johnson’s oscillator signal of frequency fb. The added circuit in this Office Action proposal is AFC circuit 34 of Kitayama (i.e., FIG. 11). The Office Action asserts, in essence, that microprocessor 307 controls reference oscillator 324 which in turn controls VCO 309 to provide an oscillator signal at frequency fb to a frequency converter. In the case of Kitayama, the frequency converter is identified as frequency converter circuit 1 of Kitayama’s FIG. 11. In the case of Johnson, the frequency converter is identified as mixer 4 of Johnson’s FIG. 2.

Assuming that this is the modification of Johnson’s sonar receiving arrangement that is proposed in the Office Action, the rejection of claims 1-2, 9, 14-15 and 21 under 35 U.S.C. §103(a) as being unpatentable over Johnson in view of Kitayama is still traversed, at least because neither Johnson nor Kitayama provides any motivation to make this specific proposed modification.

The Office Action asserts that “it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Johnson with Kitayama’s microprocessor controlled oscillator signal for frequency conversion 1, such that frequency error could be simply directly controlled by microprocessor, with low cost,” (OA page 3, lines 15-19). The motivation to modify Johnson asserted by the Office Action is, thus, to simply directly control the frequency error with low cost.

First, the asserted motivation is not a motivation for making the proposed modification to Johnson, but instead is motivation only for making a modification to Kitayama’s automatic frequency control circuit (AFC circuit) to control an error in the error signal of phase comparator

303 (Kitayama column 3, lines 6-7). Johnson does not have such an AFC circuit with a phase comparator that produces an error signal that includes errors. Second, if the AFC circuit of Kitayama were to be added to Johnson's sonar receiving arrangement to provide an oscillator signal at frequency f_b , as proposed by the Office Action, the proposed modification would stabilize the frequency of the signal output of mixer 4 and eliminate the very information used by Johnson's sonar receiving arrangement for determining a bearing to an echo reflector. The proposed modification would render Johnson's sonar receiving arrangement unsuitable for its intended purpose. Under such circumstances, there can be no suggestion or motivation to make the proposed modification.

2. The Asserted Motivation Is Not Motivation To Make The Proposed Modification Of Johnson

The frequency error, the control of which is the Office Action's asserted motivation to modify Johnson, is produced by phase comparator 303 in Kitayama (column 3, lines 6-7). Johnson does not have such a phase comparator, and therefore, Johnson does not have an error signal from a phase comparator that might include an error that needs to be controlled, or would be benefited by being controlled. The statements in Kitayama upon which the Office Action relies for its asserted motivation comes from a portion of Kitayama that explains the need to control an error that might be included in an error signal from phase comparator 303. Such asserted motivation is only relevant to processing signals through the automatic frequency control circuit (AFC circuit) of Kitayama. Johnson does not have an AFC circuit. The Office Action's asserted motivation is not relevant to Johnson's sonar receiving system, and therefore this asserted motivation cannot suggest or motivate a person of ordinary skill in the art to modify Johnson's sonar receiving arrangement as proposed by the Office Action.

The error signal (i.e., Kitayama's signals 304, 305) to be corrected for frequency errors is present only in the closed control loop completed by AFC circuit 3 of Kitayama (or equivalent closed control loops). The Kitayama closed control loop begins with the output of frequency conversion circuit 1, then passes through band pass filter 201, frequency divider 301, phase comparator 303 (comparing the signal with reference oscillator 302), microprocessor 307, D/A

circuit 308, VCO 309 that generates a local oscillator signal that is input to frequency conversion circuit 1 (see Kitayama, FIG. 1). The frequency error is discussed in Kitayama (column 2, line 62 through column 3, line 26) and discussed above with respect to the reasons why Kitayama is non-analogous art. The frequency error, to be corrected by the Kitayama circuit, arises due to a digital modulation signal passing through band pass filter 201. As the frequency of the digital modulation signal varies across the band pass of filter 201 (Kitayama), the error signals 304, 305 out of comparator 303 (see FIG. 1, Kitayama) will vary due to the phase and amplitude variations of filter 201, not because of any variation of frequency in the digital modulation signal. This would result in adjusting the frequency out of VCO 309 to correct for variations due to the filter 201, not due to any actual frequency variations in the digital modulation signal.

In contrast, the sonar receiving arrangement of Johnson's FIG. 2 does not include a closed control loop capable of producing the frequency error requiring correction. Absent production of the error signal (such as Kitayama 304, 305) needing correction for a frequency error, the Office Action's asserted motivation to modify Johnson would not apply to Johnson. Clearly, the need to correct Kitayama's error signals 304, 305 would not motivate a person of ordinary skill in the art to make the proposed modification to Johnson. Perhaps this might be expected when the asserted case for obviousness is based on combining two references from technologies as diverse as active sonar technology and RF communications demodulator technology.

M.P.E.P. 2143.01 instructs that "Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art." "[T]he central question is whether there is reason to combine references," *McGinley v. Franklin Sports, Inc.*, 262 F.3d 1339, 1351-52, 60 USPQ2d 1001, 1008 (Fed. Cir. 2001). "The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. *In re Mills*, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990)." See M.P.E.P., section 2143.01, page 2100-98, Rev. 1, Feb. 2000, 7th Ed (emphasis in the original).

Motivation must be found with specificity. “[T]here must be some motivation, suggestion, or teaching of the desirability of making the specific combination that was made by the applicant,” *In re Dance*, 160 F.3d 1339, 1343, 48 USPQ2d 1635, 1637 (Fed. Cir. 1998). “[T]eachings of references can be combined only if there is some suggestion or incentive to do so,” (emphasis in original), *In re Fine*, 837 F.2d 1071, 1075, 5 USPQ2d 1596, 1600 (Fed. Cir. 1988). “[P]articular findings must be made as to the reason the skilled artisan, with no knowledge of the claimed invention would have selected these components for combination in the manner claimed,” *In re Kotzab*, 217 F.3d 1365, 1371, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000). “[E]ven when the level of skill in the art is high, the Board must identify specifically the principle, known to one of ordinary skill, that suggests the claimed combination. In other words, the Board must explain the reasons one of ordinary skill in the art would have been motivated to select the references and to combine them to render the claimed invention obvious,” *In re Rouffet*, 149 F.3d 1350, 1359, 47 USPQ2d 1453, 1459 (Fed. Cir. 1998). The Patent Office can satisfy this burden of showing the obviousness of the combination “only by showing some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references,” *In re Fitch*, 972 F.2d 1260, 1265, 23 USPQ2d 1780, 1783 (Fed. Cir. 1992).

Accordingly, withdrawal of the rejection of claims 1-2, 9, 14-15 and 21 under 35 U.S.C. §103(a) as being unpatentable Johnson in view of Kitayama is earnestly solicited at least because the Office Action has failed to establish a *prima facie* case of obviousness. In particular, the asserted motivation would not suggest or motivate a person of ordinary skill in the art to make the particular modification to Johnson as proposed in the Office Action.

3. The Proposed Modification Would Render Johnson’s Sonar System Unsuitable For Its Intended Purpose

If an AFC circuit were to be added to Johnson’s sonar receiver arrangement as proposed, Johnson’s sonar receiver arrangement would be rendered unsuitable for its intended purpose. Johnson’s sonar receiver arrangement includes a sonar transmitter that transmits a pulsed signal with a frequency that increases progressively during each pulse period from a frequency f to a

frequency $f + \Delta f$ (column 1, lines 14-17, 65-68). Johnson's sonar receiver arrangement relies on and exploits the detection of the progressively increasing frequency Δf in order to determine the bearing angle to an echo reflector. It is the differential reception, at transducers 1 and 2, of this frequency progression that is used to determine the bearing angle to an echo reflector. If an AFC circuit were to be used to adjust the local oscillator frequency f_b to stabilize the frequency of the signal output of mixer 4, then the sonar echo signal receiver would be denied the vary information it needs to determine the bearing angle. The sonar receiver would loose critical information and become incapable of determining the bearing angle. This certainly would deter anyone from modifying Johnson as proposed in the Office Action. "If proposed modification would render the prior art invention being modified [i.e., Johnson] unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984)." See M.P.E.P., section 2143.01, page 2100-99, Rev. 1, Feb. 2000, 7th Ed.

Accordingly, withdrawal of the rejection of claims 1-2, 9, 14-15 and 21 under 35 U.S.C. §103(a) as being unpatentable Johnson in view of Kitayama is earnestly solicited at least because the Office Action has failed to establish a *prima facie* case of obviousness. In particular, no suggestion or motivation can be found for the proposed modification on Johnson since Johnson's sonar receiving system would cease to work for its intended purpose.

D. Johnson In View Of Kitayama Does Not Disclose All Claimed Limitations

Even if, *arguendo*, Johnson were to be regarded as analogous art to the presently claimed invention, even if, *arguendo*, Kitayama were to be regarded as analogous art to the presently claimed invention and even if, *arguendo*, Kitayama were to be combinable with Johnson in the manner proposed in the Office Action, the combination of Johnson in view of Kitayama still would not disclose, teach or suggest all of the limitations specified in claims 1-2, 9, 14-15 and 21.

As to claims 1-2, 14-15 and 21, Johnson in view of Kitayama does not disclose, teach or suggest a receiver that includes first and second frequency converters "coupled to respective first

and second antennas” as specified in claims 1-2 and 14-15. Johnson in view of Kitayama does not disclose, teach or suggest a receiver that includes “an RF bridge that includes plural frequency converters and two antennas” as specified in claim 21. Johnson discloses only transducers.

Accordingly, withdrawal of the rejection of claims 1-2, 14-15 and 21 under 35 U.S.C. §103(a) as being unpatentable Johnson in view of Kitayama is earnestly solicited at least because the Office Action has failed to establish a *prima facie* case of obviousness where all of the claimed limitations are disclosed, taught or suggested by the applied references.

As to claims 9 and 14-15, Johnson in view of Kitayama does not disclose, teach or suggest a receiver that includes a processor where the processor includes:

a digital frequency source to generate a reference signal based on a signal from a clock source, the reference signal being coupled to the RF bridge; and

circuitry to detect a frequency difference from the information signal based on the signal from the clock source,

as specified in claim 9, and therefore contained in claims 14-15 dependent on claim 9. As specified, the “circuitry to detect a frequency difference” is based on the same signal from the clock source as is used by the “digital frequency source to generate a reference signal.” This feature is absent from Johnson in view of Kitayama. Johnson discloses a processor coupled to a filter bank (column 2, lines 53-60). Kitayama discloses microprocessor 307. However, Johnson in view of Kitayama does not disclose that the processors are connected or provided with a common signal from a clock source.

Accordingly, withdrawal of the rejection of claims 9 and 14-15 under 35 U.S.C. §103(a) as being unpatentable Johnson in view of Kitayama is earnestly solicited at least because the Office Action has failed to establish a *prima facie* case of obviousness where all of the claimed limitations are disclosed, taught or suggested by the applied references.

III. The Office Action Fails To Establish *Prima Facie* Obviousness Against Claims 10-11,
17, 20 and 22-23

The Office Action rejects claims 10-11, 17, 20 and 22-23 under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 4,245,220 to Johnson in view of U.S. Patent No. 5,107,522 to Kitayama, et al. (hereinafter Kitayama), as applied to claim 9, and further in view of U.S. Patent No. 5,570,099 to DesJardins. This rejection is respectfully traversed.

A. Johnson In View Of Kitayama And DesJardins Fails To Render Claims 10 and 11 Obvious For Reasons Discussed With Respect To The Rejections Over Johnson In View Of Kitayama

First, as discussed above, the Office Action fails to establish a *prima facie* case of obviousness at least because Johnson is non-analogous art and cannot be a reference suitable for asserting a rejection under 35 U.S.C. §103(a).

Second, as discussed above, the Office Action fails to establish a *prima facie* case of obviousness at least because Kitayama is non-analogous art and cannot be a reference suitable for asserting a rejection under 35 U.S.C. §103(a).

Third, as discussed above, the Office Action fails to establish a *prima facie* case of obviousness at least because Johnson in view of Kitayama does not provide a motivation to modify the sonar receiving arrangement of Johnson to include the AFC circuit of Kitayama as proposed by the Office Action. Furthermore, the addition of DesJardins to the applied art does not disclose, teach or suggest modifying the sonar receiving arrangement of Johnson to include the AFC circuit of Kitazawa as proposed by the Office Action.

Fourth, as discussed above, the Office Action fails to establish a *prima facie* case of obviousness at least because Johnson in view of Kitayama does not disclose, teach or suggest a receiver that includes a processor where the processor includes:

a digital frequency source to generate a reference signal based on a signal from a clock source, the reference signal being coupled to the RF bridge; and

circuitry to detect a frequency difference from the information signal based on the signal from the clock source,

as specified in claim 9, and therefore contained in claims 10 and 11 dependent on claim 9. Furthermore, the addition of DesJardins to the applied art does not disclose, teach or suggest modifying Johnson's sonar receiver into a receiver that includes "a digital frequency source to generate a reference signal" and "circuitry to detect" where both are based on a signal from the same clock source or evidence of a motivation to modify the sonar receiving arrangement of Johnson to include this feature of claim 9.

Accordingly, withdrawal of the rejection of claims 10 and 11 under 35 U.S.C. §103(a) as being unpatentable Johnson in view of Kitayama and further in view of DesJardins is earnestly solicited.

B. Additional Reasons Why Johnson In View Of Kitayama And DesJardins Fails To Render Claims 10 and 11 Obvious

In addition, the Office Action fails to establish a *prima facie* case of obviousness of claims 10-11 at least because Johnson in view of Kitayama and further in view of DesJardins does not disclose, teach or suggest a receiver that includes a processor that includes circuitry to detect where the "circuitry to detect" includes:

a first Fourier transformer having a first center frequency; and

a second Fourier transformer having a second center frequency,

as specified in claim 10, and therefore contained in all claims dependent on claim 10.

The Office Action asserts that the first and second Hilbert transformers 18, 34 described in DesJardins reads on the first and second Fourier transformers specified in claim 10. This assertion is respectfully traversed.

Claim 9 specifies a processor that includes circuitry to detect a frequency difference from the information signal. The information signal is input to the "circuitry to detect," and it is the circuitry to detect that includes the first and second Fourier transformers.

The Office Action construes the information signal specified in claim 9 to be signals from Johnson's filter bank 7, 9 (Johnson FIG. 2) connected to a processor. See Office Action page 4, lines 11-18. Since claims 10 and 11 are dependent on claim 9, the information signal specified in claims 10 and 11, must be the same. Nevertheless, in its rejection of claim 10, the Office Action asserts that the first and second Hilbert transformers 18, 34 described in DesJardins reads on the first and second Fourier transformers specified in claim 10. This cannot be. Hilbert transformer 18 is part of site 10, and Hilbert transformer 34 is part of site 12. These filters are position ahead of combining any signals from sites 10 and 12 (DesJardins FIG. 2). At the point in the processing chain where Hilbert transformers 18, 34 are located, there is no information signal produced by an RF bridge that can be input into the "circuitry to detect" as specified in claim 9, and the first and second Fourier transformers specified in claim 10 are specified as being included in the "circuitry to detect."

Accordingly, even if, *arguendo*, Johnson's circuit depicted in FIG. 2, were to be modified to include DesJardins' Hilbert transformers 18, 34, the modification would not achieve the invention of claims 10 and 11 at least because the first and second Fourier transformers of claim 10 are specified as being included in the circuitry to detect which processes the information signal. Moreover, neither Johnson, Kitayama nor DesJardins disclose any motivation to modify Johnson's FIG. 2 to include Hilbert transformers 18, 34 from DesJardins in the processing chain after filter bank 7, 9.

Furthermore, the Office Action fails to establish a *prima facie* case of obviousness of claims 10-11 at least because Johnson in view of Kitayama and further in view of DesJardins does not disclose, teach or suggest a receiver that includes a processor that includes circuitry to detect that includes first and second Fourier transformers having first and second center frequencies where the first center frequency is different than the second center frequency as specified in claim 10, and therefore contained in all claims dependent on claim 10.

Claim 10 specifies first and second Fourier transformers having corresponding first and second center frequencies, and that the first and second center frequencies are different. DesJardins discloses that Hilbert transformer 18 of site 10 "moves one of the complex spectra to

base band and filters out the other,” column 1, lines 60-61. Then, DesJardins discloses that “site 12 performs identical ... Hilbert transformation 34,” column 2, lines 28-30. In other words, both Hilbert transformers 18 and 34 move one of the complex spectra to base band. Johnson in view of Kitayama and further in view of DesJardins does not disclose, teach or suggest that first and second center frequencies are different as specified in claim 10 and therefore contained in all claims dependent thereon.

Accordingly, withdrawal of the rejection of claim 10 and all claims dependent on claim 10 under 35 U.S.C. §103(a) as being unpatentable Johnson in view of Kitayama and further in view of DesJardins is earnestly solicited at least because the Office Action has failed to establish a *prima facie* case of obviousness where all of the claimed limitations are disclosed, taught or suggested by the applied references.

Furthermore, the Office Action fails to establish a *prima facie* case of obviousness of claim 11 at least because Johnson in view of Kitayama and further in view of DesJardins does not disclose, teach or suggest a receiver that includes a processor that includes circuitry to detect where the circuitry to detect includes a digital frequency generator that generates:

a first digital signal at the first center frequency coupled to the first Fourier transformer; and

a second digital signal at the second center frequency coupled to the second Fourier transformer,

as specified in claim 11.

The Office Action asserts that A/D converters 16, 32 of DesJardins constitute the digital frequency generator. This assertion is respectfully traversed.

Johnson in view of Kitayama and further in view of DesJardins does not disclose, teach or suggest a digital frequency generator of the type that generates first and second digital signals at the first and second center frequencies (of the respective first and second Fourier transformers), respectively, where the first center frequency is different than the second center frequency.

Accordingly, withdrawal of the rejection of claim 11 under 35 U.S.C. §103(a) as being unpatentable Johnson in view of Kitayama and further in view of DesJardins is earnestly

solicited at least because the Office Action has failed to establish a *prima facie* case of obviousness where all of the claimed limitations are disclosed, taught or suggested by the applied references.

C. Johnson In View Of Kitayama And DesJardins Fails To Render Claims 17, 20 and 22-23 Obvious For Reasons Discussed With Respect To The Rejections Over Johnson In View Of Kitayama

First, as discussed above, the Office Action fails to establish a *prima facie* case of obviousness at least because Johnson is non-analogous art and cannot be a reference suitable for asserting a rejection under 35 U.S.C. §103(a).

Second, as discussed above, the Office Action fails to establish a *prima facie* case of obviousness at least because Kitayama is non-analogous art and cannot be a reference suitable for asserting a rejection under 35 U.S.C. §103(a).

Third, as discussed above and with respect to claim 16, Kitayama does not provide motivation to modify Johnson's sonar receiving arrangement to add the AFC circuit of Kitayama. Accordingly, Johnson in view of Kitayama does not disclose, teach or suggest a method that includes:

capturing a frequency difference that is present at first and second antennas;

producing an information signal onto which the frequency difference has been modulated; and

analyzing the information signal to determine the frequency difference,

as specified in claim 16, and therefore contained in all claims dependant thereon. DesJardins also does not disclose, teach or suggest this feature; therefore, claims 17, 20 and 22-23 are not rendered obvious by Johnson in view of Kitayama and DesJardins.

D. Additional Reasons Why Johnson In View Of Kitayama And DesJardins Fails To Render Claims 17, 20 and 23 Obvious

First, even if, *arguendo*, Johnson were to be regarded as analogous art to the presently claimed invention, even if, *arguendo*, Kitayama were to be regarded as analogous art to the presently claimed invention and even if, *arguendo*, Kitayama were to be read as including motivation for modifying Johnson's sonar receiver to include a AFC circuit according to Kitayama in the manner proposed in the Office Action, the Office Action still fails to establish a *prima facie* case of obviousness at least because Johnson in view of Kitayama and further in view of DesJardins does not disclose, teach or suggest a method where the step of analyzing includes:

forming a first Fourier transform of the information signal at a first center frequency; and

forming a second Fourier transform of the information signal at a second center frequency, the second center frequency being different than the first center frequency,

as specified in claim 17, and therefore contained in all claims dependent on claim 17.

The modification proposed by the Office Action does not form first and second Fourier transforms of the same information signal as specified in claim 17, and therefore contained in all claims dependent thereon.

Claim 17 specifies "analyzing the information signal" (onto which a frequency difference has been modulated, see claim 16) by forming first and second Fourier transforms of the same information signal. The modification proposed in the Office Action does not include processing the same information signal as discussed above with respect to the rejection of claim 10. DesJardins discloses processing a first signal through a receiver 9, an A/D 16, a Hilbert transform 18, and then through a FIR filter 20 at one site 10. DesJardins also discloses processing a second signal, a different signal, through a receiver 11, an A/D 32, a Hilbert transform 34, and then through a FIR filter 36 at another site 12. DesJardins does not disclose that the same information signal is processes in first and second Fourier transforms as specified in claim 17.

The Office Action asserts that the motivation to modify Johnson to include the “accurate digital processing Hilbert transforms, FIR filter for two receiving path” according to DesJardins is so that the “calculated frequency difference, range, information could be accurate.” The Johnson sonar receiver does not even attempt to determine range, and therefore, any desire to improve range accuracy cannot be regarded as motivation to modify Johnson to employ a Hilbert transform and a FIR filter instead of each Fourier filter.

The motivation of accuracy asserted in the Office Action requires the Hilbert transform and a FIR filter to be employed in each of two receiving paths (between respective A/Ds 16, 32 and the cross-correlation 40 or 110 or 210), before any frequency difference can be determined or modulated onto an information signal as specified in claim 16. Simply put, the motivation asserted in the Office Action, does not support reading the Hilbert transforms and a FIR filters onto the Fourier transforms as specified in claims 17, and therefore contained in all claims dependent thereon. Instead, the motivational teaching in DesJardins cited by the Office Action would, at most, suggest certain processing steps be conducted before “producing an information signal” as specified in claim 16. But, claim 17 specifies limitations on the step of “analyzing the information signal” that can only occur after a step of “producing an information signal.” The motivation asserted in the Office Action from DesJardins, does not suggest or teach modifying the sonar receiver of Johnson, as allegedly modified by Kitayama, to achieve the features specified by claim 17, and therefore contained in all claims dependent on claim 17.

Second, the Office Action fails to establish a *prima facie* case of obviousness of claims 17, 20 and 23 at least because Johnson in view of Kitayama and further in view of DesJardins does not disclose, teach or suggest a method where the step of analyzing forms a first Fourier transform at a first center frequency and forms a second Fourier transform at a second center frequency, where the second center frequency is different than the first center frequency as specified in claim 17, and therefore contained in all claims dependent on claim 17.

The Office Action asserts that DesJardins discloses that the center frequency for FIR filter 20 is different than the center frequency for FIR filter 36. This assertion is respectfully traversed as lacking any support. DesJardins does not disclose, teach or suggest forming first

and second Fourier transforms of the information signal at corresponding first and second center frequencies where the first and second center frequencies are different. As discussed above with respect to claim 10, DesJardins discloses that Hilbert transformer 18 of site 10 "moves one of the complex spectra to base band and filters out the other," (column 1, lines 60-61) and that "site 12 performs identical ... Hilbert transformation 34," column 2, lines 28-30. Both Hilbert transformers 18 and 34 move one of the complex spectra to base band. Johnson in view of Kitayama and further in view of DesJardins does not disclose, teach or suggest that first and second center frequencies are different as specified in claim 10 and therefore contained in all claims dependent thereon.

Accordingly, withdrawal of the rejection of claim 17 and all claims dependent on claim 17 (including claim 20 and 23) under 35 U.S.C. §103(a) as being unpatentable Johnson in view of Kitayama and further in view of DesJardins is earnestly solicited at least because the Office Action has failed to establish a *prima facie* case of obviousness where all of the claimed limitations are disclosed, taught or suggested by the applied references.

E. Johnson In View Of Kitayama And DesJardins Fails To Render Claim 22 Obvious

As discussed above and with respect to claim 16, Kitayama does not provide motivation to modify Johnson's sonar receiving arrangement to add the AFC circuit of Kitayama. Accordingly, Johnson in view of Kitayama does not disclose, teach or suggest a method that includes:

capturing a frequency difference that is present at first and second antennas;

producing an information signal onto which the frequency difference has been modulated; and

analyzing the information signal to determine the frequency difference,

as specified in claim 16, and therefore contained in all claims dependant thereon. DesJardins also does not disclose, teach or suggest this feature; therefore, claim 22 is not rendered obvious by Johnson in view of Kitayama and DesJardins.

IV. The Office Action Fails To Establish *Prima Facie* Obviousness Against Claim 12

The Office Action rejects claim 12 under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 4,245,220 to Johnson in view of U.S. Patent No. 5,107,522 to Kitayama, et al. (hereinafter Kitayama), and further in view of U.S. Patent No. 5,570,099 to DesJardins, as applied to claim 10, and further in view of U.S. Patent No. 4,903,030 to Maitre et al. (hereinafter Maitre). This rejection is respectfully traversed.

A. Johnson In View Of Kitayama And DesJardins And Maitre et al. Fails To Render Claim 12 Obvious For Reasons Discussed With Respect To The Rejection Of Claim 10 Over Johnson In View Of Kitayama And DesJardins

First, as discussed above, the Office Action fails to establish a *prima facie* case of obviousness at least because Johnson is non-analogous art and cannot be a reference suitable for asserting a rejection under 35 U.S.C. §103(a).

Second, as discussed above, the Office Action fails to establish a *prima facie* case of obviousness at least because Kitayama is non-analogous art and cannot be a reference suitable for asserting a rejection under 35 U.S.C. §103(a).

Third, as discussed above, the Office Action fails to establish a *prima facie* case of obviousness at least because Johnson in view of Kitayama does not provide a motivation to modify the sonar receiving arrangement of Johnson to include the AFC circuit of Kitayama as proposed by the Office Action. Furthermore, the addition of either DesJardins or Maitre, or both, to the applied art does not disclose, teach or suggest modifying the sonar receiving arrangement of Johnson to include the AFC circuit of Kitazawa as proposed by the Office Action.

Fourth, as discussed above with respect to claim 9, the Office Action fails to establish a *prima facie* case of obviousness at least because Johnson in view of Kitayama does not disclose, teach or suggest a receiver that includes a processor where the processor includes:

a digital frequency source to generate a reference signal based on a signal from a clock source, the reference signal being coupled to the RF bridge; and

circuitry to detect a frequency difference from the information signal based on the signal from the clock source,

as specified in claim 9, and therefore contained in claims 10 and 11 dependent on claim 9. Furthermore, the addition of either DesJardins or Maitre to the applied art does not disclose, teach or suggest modifying Johnson's sonar receiver into a receiver that includes "a digital frequency source to generate a reference signal" and "circuitry to detect" where both are based on a signal from the same clock source clock source or evidence of a motivation to modify the sonar receiving arrangement of Johnson to include this feature of claim 9.

Fifth, as discussed above with respect to claim 10, the Office Action fails to establish a *prima facie* case of obviousness of claim 10 at least because Johnson in view of Kitayama and further in view of DesJardins does not disclose, teach or suggest a receiver that includes a processor that includes circuitry to detect where the "circuitry to detect" includes:

a first Fourier transformer having a first center frequency; and

a second Fourier transformer having a second center frequency,

as specified in claim 10, and therefore contained in all claims dependent on claim 10.

The Office Action asserts that the first and second Hilbert transformers 18, 34 described in DesJardins reads on the first and second Fourier transformers specified in claim 10. However, claim 9 specifies a processor that includes circuitry to detect a frequency difference from the information signal which the Office Action construes to be signals from Johnson's filter bank 7, 9 (Johnson FIG. 2) connected to a processor. See Office Action page 4, lines 11-18. Since claims 10 and 12 are dependent on claim 9, the information signal specified in claim 10, must be the same. Hilbert transformer 18 is part of site 10, and Hilbert transformer 34 is part of site 12. These filters are position ahead of combining any signals from sites 10 and 12 (DesJardins FIG.

2). The addition of Maitre to the applied art does not disclose, teach or suggest modifying Johnson's sonar receiver to somehow move Hilbert transformers 18 and 34 (of DesJardins) to a location after signals from sites 10 and 12 are combined.

Sixth, as discussed above with respect to claim 10, the Office Action fails to establish a *prima facie* case of obviousness of claim 10 at least because Johnson in view of Kitayama and further in view of DesJardins does not disclose, teach or suggest a receiver that includes a processor that includes circuitry to detect that includes first and second Fourier transformers having first and second center frequencies where the first center frequency is different than the second center frequency as specified in claim 10, and therefore contained in claim 12 dependent on claim 10. Johnson in view of Kitayama and further in view of DesJardins does not disclose, teach or suggest that first and second center frequencies are different as specified in claim 10 and therefore contained in claim 12 dependent thereon. Furthermore, the addition of Maitre to the applied art does not disclose, teach or suggest modifying Johnson's sonar receiver so that the first and second center frequencies are different as specified in claim 10 and therefore contained in claim 12 dependent thereon.

B. Additional Reasons Why Johnson In View Of Kitayama And DesJardins And Maitre Fails To Render Claim 12 Obvious

In addition, the Office Action fails to establish a *prima facie* case of obviousness of claims 10-11 at least because Johnson in view of Kitayama and further in view of DesJardins and further in view of Maitre does not disclose, teach or suggest that "the circuitry to detect further includes a frequency discriminator coupled to the first and second Fourier transformers" as specified in claim 12.

First, the Office Action asserts that modifying Johnson in view of Kitayama and further in view of DesJardins to include Maitre's discriminator 27 is coupled to frequency analysis 26 of Maitre will render claim 12 obvious. This assertion is respectfully traversed.

As discussed above with respect to claim 10, Hilbert transformers 18 and 34 (of DesJardins) are located before signals are combined from sites 10 and 12, not after signals from sites 10 and 12 are combined. Furthermore, both Hilbert transformers are used to shift the complex spectra to base band. As a result, the use of a frequency discriminator coupled to such Hilbert transformers would not achieve the structure specified in claim 12.

Second, the applied art provides no motivation to couple Maitre's frequency discriminator 27 to the claimed first and second Fourier transformers (different than Hilbert transformers) in the specific way specified in claim 12.

The Office Action asserts that the motivation is "such that the angle of signal arrival could be accurately measured" (page 9, lines 6 and 7). This assertion is respectfully traversed. The first and second Fourier transformers specified by claim 10 are such that the frequency discriminator of claim 12 measures range, not angle of arrival.

Accordingly, withdrawal of the rejection of claim 12 under 35 U.S.C. §103(a) as being unpatentable Johnson in view of Kitayama and further in view of DesJardins as applied to claim 10, and further in view of Maitre et al. is earnestly solicited at least because the Office Action has failed to establish a *prima facie* case of obviousness where all of the claimed limitations and required motivations to modify are disclosed, taught or suggested by the applied references.

V. Claim 13 Is In Proper Form For Allowance

The Office Action objects claim 13 as being dependent upon a rejected base claim. Claim 13 is dependent on claim 10. The implied assertion that claim 10 is properly rejected is respectfully traversed for at least the reasons discussed above with respect to the rejection of claim 10. Upon reconsideration of claim 10 and a finding of the patentability of claim 10, claim 13 is in condition for allowance. Withdrawal of the objection to claim 13 is earnestly solicited.

By traversing all of the above rejections based on the specific remarks discussed above, I do not intend to imply that other grounds do not exist for traversing any or all rejections.

CONCLUSION

In view of the present amendments and remarks, withdrawal of the rejections of the claims is earnestly solicited. It is respectfully submitted that the present application is in condition for allowance. Prompt reconsideration and allowance of the application are earnestly solicited. Should the examiner believe that any further action is necessary to place the application in condition for allowance, the examiner is invited to contact the undersigned applicant at the telephone number listed below. Furthermore, please note the change of address and telephone number.

Respectfully submitted,

A handwritten signature in cursive script that reads "Daniel E. Fisher". The signature is written in dark ink and is positioned above a horizontal line.

Daniel E. Fisher

New 703-542-2399
New 40452 Hickory Ridge Place
Aldie, VA 20105